

FORM PTO-1390  
(REV 5-93)

U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A  
FILING UNDER 35 U.S.C. 371**

1752/49096

U S APPLICATION NO (if known, see 37 CFR 1.5)

**09/622830**

|   |  |  |
|---|--|--|
| INTERNATIONAL APPLICATION NO.<br>PCT/EP99/00991 | INTERNATIONAL FILING DATE<br>16 February 1999 (16.02.99) | PRIORITY DATE CLAIMED<br>24 February 1998 (24.02.98) |
|---|--|--|

TITLE OF INVENTION  
BEDSTEADAPPLICANT(S) FOR DO/EO/US  
Manfred ELZENBECK

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1.  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2.  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371
3.  This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1)).
4.  A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5.  A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a.  is transmitted herewith (required only if not transmitted by the International Bureau).
  - b.  has been transmitted by the International Bureau
  - c.  is not required, as the application was filed in the United States Receiving Office (RO/US)
6.  A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7.  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a.  are transmitted herewith (required only if not transmitted by the International Bureau).
  - b.  have been transmitted by the International Bureau.
  - c.  have not been made; however, the time limit for making such amendments has NOT expired.
  - d.  have not been made and will not be made.
8.  A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9.  An UNEXECUTED oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10.  A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Item 11. to 16. below concern other document(s) or information included:**

11.  An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12.  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13.  A **FIRST** preliminary amendment.
   
 A **SECOND** or **SUBSEQUENT** preliminary amendment.
14.  A substitute specification.
15.  A change of power of attorney and/or address letter.
16.  Other items or information:  
PCT/IB/308, PCT/IB/346 and International Search Report with English Translation

|  |                               |                           |           |           |
|--|-------------------------------|---------------------------|-----------|-----------|
| U.S. APPLICATION NO. (if known, see 37 CFR 1.6)  | INTERNATIONAL APPLICATION NO. | ATTORNEY'S DOCKET NUMBER  |           |           |
| <b>09/622830</b>   | PCT/EP99/00991                | 1752/49096                |           |           |
| 17. [ ] The following fees are submitted:<br>Basic National Fee (37 CFR 1.492(a)(1)-(5)):  |                               | CALCULATIONS PTO USE ONLY |           |           |
| Search Report has been prepared by the EPO or JPO ..... \$840.00<br>International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$670.00<br>No international preliminary examination fee paid to USPTO (37 CFR 1.482)   |                               | \$ 840.00                 |           |           |
| but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$760.00<br>Neither international preliminary examination fee (37 CFR 1.482) nor   |                               |                           |           |           |
| international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$ 970.00<br>International preliminary examination fee paid to USPTO (37 CFR 1.482)  |                               |                           |           |           |
| and all claims satisfied provisions of PCT Article 33(2)-(4) ..... \$96.00   |                               |                           |           |           |
| <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>  |                               | <b>\$ 840.00</b>          |           |           |
| Surcharge of \$130.00 for furnishing the oath or declaration later than [ ] 20 [ X ] 30  |                               |                           |           |           |
| months from the earliest claimed priority date (37 CFR 1.492(e)).  |                               | \$ 130.00                 |           |           |
| Claims   | Number Filed                  | Number Extra              | Rate      |           |
| Total Claims   | 42-20=                        | 22                        | X \$18.00 | \$ 396.00 |
| Independent Claims   | 5-3=                          | 2                         | X \$78.00 | \$ 156.00 |
| Multiple dependent claims(s) (if applicable)   |                               | + \$260.00                | \$        |           |
| <b>TOTAL OF ABOVE CALCULATIONS =</b>   |                               | <b>\$ 1,522.00</b>        |           |           |
| Reduction by 1/2 for filing by <u>small entity</u> , if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).   |                               | \$                        |           |           |
| <b>SUBTOTAL =</b>  |                               | <b>\$ 761.00</b>          |           |           |
| Processing fee of \$130.00 for furnishing the English translation later than [ ] 20 [ ] 30   |                               | \$                        |           |           |
| months from the earliest claimed priority date (37 CFR 1.492(f)).  |                               | + \$                      |           |           |
| <b>TOTAL NATIONAL FEE =</b>  |                               | <b>\$ 761.00</b>          |           |           |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28,3.31). \$40.00 per property +  |                               | \$                        |           |           |
| <b>TOTAL FEE ENCLOSED =</b>  |                               | <b>\$ 761.00</b>          |           |           |
|  |                               | Amount to be: \$          |           |           |
|  |                               | refunded                  |           |           |
|  |                               | charged \$                |           |           |
| <p>a. [ X ] One check in the amount of <u>\$ 761.00</u> for the filing fee is enclosed</p> <p>b. [ ] Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. [ X ] The Commissioner is hereby authorized to charge any additional fees, which may be required, or credit any overpayment to Deposit Account No. <u>05-1323</u>. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO:<br/>Evenson, McKeown, Edwards &amp; Lenahan, P.L.L.C.<br/>1200 G Street, N.W., Suite 700<br/>Washington, D.C. 20005<br/>Tel. No. (202) 628-8800<br/>Fax No. (202) 628-8844</p> |                               |                           |           |           |
| <br><b>SIGNATURE</b><br>Donald D. Evenson   |                               |                           |           |           |
| <b>NAME</b><br>26,160  |                               |                           |           |           |
| <b>REGISTRATION NUMBER</b><br>August 24, 2000  |                               |                           |           |           |
| <b>DATE</b>  |                               |                           |           |           |

Applicant or Patentee: Rössle & Wanner GmbH

Serial or Patent No.: PCT/EP99/00991 Attorney's Docket No.: 1752/49096

Filed or Issued: 16 February 1999

For: BEDSTEAD

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) AND 1.27(d)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

the owner of the small business concern identified below:  
 an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: Rössle & Wanner GmbH

ADDRESS OF CONCERN: Ulrichstrasse 102  
D-72116 Mössingen  
Germany

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled: BEDSTEAD  
by inventor(s) Manfred ELZENBECK  
described in

the specification filed herewith.  
 Application Serial No.: PCT/EP99/00991, filed 16 Feb. 1999  
 Patent No.: \_\_\_\_\_, issued: \_\_\_\_\_

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\*, and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as

a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern, or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

INDIVIDUAL  SMALL BUSINESS CONCERN  NONPROFIT ORGANIZATION

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

INDIVIDUAL  SMALL BUSINESS CONCERN  NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

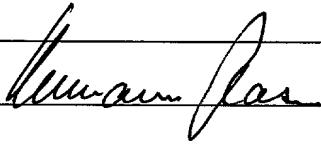
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Hermann Glaser

TITLE OF PERSON OTHER THAN OWNER: Managing Director

ADDRESS OF PERSON SIGNING: Sternbergstraße 59, 72116 Mössingen

Germany

SIGNATURE:  DATE: 26.09.2000

09/622830

534 Rec'd PCT/PTO 24 AUG 2000

Attorney Docket: 1752/49096  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: MANFRED ELZENBECK

Serial No.: Unassigned

Filed: August 24, 2000

Title: BEDSTEAD

PRELIMINARY AMENDMENT

Box PCT Application

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to substantive examination of the referenced application, please amend the application as follows.

IN THE CLAIMS:

Please cancel original Claims 1-15 and substitute the following new claims therefor:

--16. Lounge chair with a frame having longitudinal and transverse bars and with spring elements held by the frame, said spring elements being in the form of an elastic textile structure held under prestress between the longitudinal bars and forming a supporting surface covering the frame for mattresses, cushion coverings or the like, wherein the textile structure is made of knitting or woven fabric out of synthetic threads, and wherein the prestress of the textile structure at right angles to the longitudinal bars is, in at least one of several sections running

lengthways of the longitudinal bars, different from the prestress in the other sections.

17. Lounge chair according to Claim 16, wherein outer contours of the textile structure are held under prestress at the longitudinal bars and at the transverse bars.

18. Lounge chair according to Claim 16, wherein supports are provided beneath the textile structure.

19. Lounge chair according to Claim 18, wherein the supports are attached to rails which are movable in a direction of the longitudinal bars.

20. Lounge chair according to Claim 16, wherein cushions in the form of lordosis supports or knee joints can be placed on the textile structure.

21. Lounge chair according to Claim 17, wherein cushions in the form of lordosis supports or knee joints can be placed on the textile structure.

22. Lounge chair according to Claim 18, wherein cushions in the form of lordosis supports or knee joints can be placed on the textile structure.

23. Lounge chair according to Claim 19, wherein cushions in the form of lordosis supports or knee joints can be placed on the textile structure.

24. Lounge chair according to Claim 16, wherein the longitudinal bars are designed to be foldable and form articulated axles for the surface for lying.

25. Lounge chair according to Claim 17, wherein the longitudinal bars are designed to be foldable and form articulated axles for the surface for lying.

26. Lounge chair according to Claim 18, wherein the longitudinal bars are designed to be foldable and form articulated axles for the surface for lying.

27. Lounge chair according to Claim 19, wherein the longitudinal bars are designed to be foldable and form articulated axles for the surface for lying.

28. Lounge chair according to Claim 20, wherein the longitudinal bars are designed to be foldable and form articulated axles for the surface for lying.

29. Lounge chair according to Claim 16, wherein the knitting or woven fabric is made of polyester threads with a 25% elastometer polyester content.

30. Lounge chair according to Claim 16, wherein the textile structure is made up of two structures lying at a distance one below the other.

31. Lounge chair according to Claim 30, wherein each of the textile structures is tightly held with their edges to the longitudinal and transverse bars.

32. Lounge chair according to Claim 30, wherein the distance between the two textile structures is predetermined in such a way that at least a part of the surfaces of the textile structure rests on each other when there is a load.

33. Lounge chair according to Claim 30, wherein the textile structure is designed as a tube pulled over rods.

34. Lounge chair according to Claim 33, wherein the rods are mounted such that they can be rotated and are fastened to the longitudinal bars.

35. Method for the manufacture of a lounge chair according to Claim 16, comprising first forming a cut to be inserted into the frame, said cut being made of structure formed by the threads, said textile structure having crosswise measurements less than the distance between the longitudinal bars and whose outer contour, at least in one spot of one of the side walls, is not straight and parallel to the longitudinal bars, and wherein the cut formed in such a manner, while expanded at least in

transverse direction, is fastened to the longitudinal bars with its lengthwise-running outer contours.

36. Method according to Claim 35, wherein the cut of the textile structure in the longitudinal direction is less than the distance between the transverse bars of the frame, and wherein the textile structure is fastened to the transverse bars also while expanded in longitudinal direction.

37. A method of making a lounge chair of the type including a frame having longitudinal bars and transverse bars, and spring elements forming a lounge chair occupant supporting surface, said spring elements being in the form of an elastic textile fabric held under prestress at the longitudinal bars, said method comprising:

cutting the fabric with varying width along its length, and attaching the fabric longitudinal edges to the longitudinal bars under prestress by stretching the fabric laterally, thereby forming a supporting surface with varying prestress along the length of the longitudinal bars.

38. A method according to Claim 37, wherein said longitudinal bars extend parallel to one another.

39. A method according to Claim 37, comprising attaching the fabric with prestress to the transverse bars.

40. A method according to Claim 37, wherein a plurality of spaced layers of fabric are attached to the longitudinal bars with respective different prestress in the respective layers.

41. A method according to Claim 40, wherein said longitudinal bars extend parallel to one another.--

42. A method according to Claim 41, comprising attaching the fabric with prestress to the transverse bars.

REMARKS

Entry of these new claims before examination of this application is respectfully requested.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #1752/49096).

Respectfully submitted,

August 24, 2000

  
\_\_\_\_\_  
Donald D. Evenson  
Registration No. 26,160

EVENSON, McKEOWN, EDWARDS  
& LENAHAN, P.L.L.C.  
1200 G Street, N.W., Suite 700  
Washington, DC 20005  
Telephone No.: (202) 628-8800  
Facsimile No.: (202) 628-8844

DDE:gmj

3/PRTS

09/622830

BEDSTEAD

534 Rec'd PCT/PTC 24 AUG 2000

5 The invention relates to a lounge chair with a frame and spring elements held by the frame, said spring elements forming the supporting surface, covering the frame, for mattresses or the like.

10 In EP 0 734 666 A1, the supporting surface for a cushion of such a lounge chair is known, the supporting surface holding a flat underlay in a frame, on which spring elements are set on the underlay with their bases in a regular grid. The spring elements have heads that form the supporting disks for a continuous cushion or the like. Such supporting surfaces that are also supposed to be used for beds can be provided with 15 a lath grid (DE 29 707 790 U1) instead of the much more commonly used lounge chairs, with said supporting surfaces having spring laths as underlay for a mattress or the like, running at right angles to the longitudinal bars of a frame.

20 For folding chaise lounges or deckchairs, stretching a textile covering between the longitudinal and transverse bars of a foldable chaise lounge frame, such that the edges of the textile structure are placed around the longitudinal and transverse bars and fastened there, is also generally known (DE-GM 7531803). As a result, grooves must be provided on the hinges in order not to interfere with the

hinge function. Such chaise lounges cannot be used as base frames for beds.

5        The same also applies to deckchairs that can be transformed into folding lounge chairs (CH-PS 390 901), where the textile covering is pulled over the folding frame with the help of pockets placed at the head and foot end, thereby achieving the fastening of the textile structure. Providing widenings with reinforcement inserts in the joints, which help to conceal the joints, is also known. However, such chaise lounge furniture cannot be used as replacement for a bedstead. The same 10      also applies to a lounge chair intended as garden or camping furniture (AT-PS 312 844), which is constructed from a folding frame, which serves as a holding device for elastic straps that turn into a textile structure towards the center of the chaise lounge furniture. This design 15      is meant for the chaise lounge to also serve as a kind of trampoline for children.

20        And finally, chairs or deckchairs are also known (DE 44 26 316 C1), in which the seat or back surface comprises a textile cover formed into a loop at its edges, and with these, is slid on rod-like spanners, which are in turn screwed down to the longitudinal bars of the chair frame. This embodiment makes it possible to remove the cover from the frame for purposes of cleaning.

25        The task of the present invention is to design a lounge chair of the type mentioned at the start, which can also serve as a bed frame, with the design to be made in a much simpler manner, such that spring bearing pressure can be provided over the entire lying surface without having to provide in a costly manner spring elements, distributed on the

surface, on a fixed underlay or laths running at right angles to the longitudinal bars of the frame.

5 To solve this task, in a lounge chair of the type mentioned at the start, the invention suggests that the spring elements be made of a textile structure made of elastic threads, said textile structure being in the form of a knitting or woven fabric made of synthetic threads and being held under prestress at least at the longitudinal bars of the frame.

10

This embodiment creates a supporting surface for the cushion underlay of a bed or the like, which, depending on the prestress of the textile structure, can introduce spring restoring forces that is influenceable to the desired extent. The design of such a supporting frame remains extremely simple.

15

In a further embodiment of the invention, the prestress of the textile structure at right angles to the longitudinal bars can be different from that in other sections in at least one of several sections running lengthways of the longitudinal bars, making it possible, just like in lath grids or in individually adjusted spring elements, to exercise varying, zone-by-zone return forces to a chaise lounge cushion, and consequently, to a person lying on the cushion. For modern types of bed underlays, this is an important measure that promotes lying comfort, and consequently, healthy sleep. The outer edges of the textile structure can be held in a very simple manner at the longitudinal and transverse bars, in which the frame can also be provided with foldable longitudinal bars that facilitate an adjustment of the lying surface.

20

25

5        In a particularly advantageous further embodiment of the invention, the knitting or woven fabric of the textile structure can consist of polyester threads, preferably with about 25% elastomer polyester content.

10        The textile structure can also advantageously consist of two textile structures arranged at a distance one below the other, which, in the presence of a load, rest on top of each other, thereby allowing high return forces to be realized.

15        The invention also relates to a method for the manufacture of a lounge chair of the type mentioned in the beginning. In this method, a cut of the textile structure formed by the threads, to be put into the frame, is first made, its crosswise measurements being less than the distance of the longitudinal bars and its outer contour, at least at one spot of one of the side walls is not straight and parallel to the longitudinal bars. The cut formed in such a manner is, while expanded, fastened at least in crosswise direction to the longitudinal bars with its longitudinal outer contours. Since the outer contour of the cut does not run parallel to the longitudinal bars, but the outer edges are drawn up to the longitudinal bars before they are fastened there, a varying prestress of the woven fabric arises in different zones of the supporting surface designed in such a manner, as a result of which the 20        return forces exercised by the supporting surface can be divided among different zones, at least lengthways of the longitudinal bars. In this manner, it is possible to adjust the degree of the elasticity, which reacts to a load, to the spring properties of known lath grids or the 25

like, in which varying bearing pressure can likewise be exercised on a bed cushion, and consequently, on a person lying thereon.

5 Of course, it is also possible to correspondingly change the prestress of the elastic woven or knotted structure in zones that are lengthways of the transverse bars, so that in this manner, in a relatively simple way, and without having to distribute individual spring elements on a supporting surface, zones of greater and lesser return forces can be realized for the supporting surface.

10

The invention is presented with the help of an embodiment in the drawing and will be explained in the following. To illustrate:

15 Fig. 1 a perspective representation of a lounge chair according to the invention, with sections of the lying surface adjusted differently,

20 Fig. 2 a side view of the lounge chair of Fig. 1, but with a cushion support and with a representation of the sections of the lying surface folded down to a common horizontal plane,

25 Fig. 3 the front view of the lounge chair of Figure 2 with sections of the lying surface found in the folded down position,

Fig. 4 the section through the lounge bed of Fig. 2 along Line IV,

Fig. 5 a schematic representation of a weave section,  
which is subsequently held tightly in the lounge  
bed frame,

5 Fig. 6 an enlarged partial representation of the detail  
VI of Fig. 4,

10 Fig. 7 a partial representation similar to Fig. 6, but  
in another form of embodiment, and

15 Fig. 8 a partial representation similar to Fig. 6, but  
in another form of embodiment.

20 A lounge chair is shown in Figures 1 and 2, consisting of a base  
frame 2 provided with supports 1, said base frame with longitudinal bars  
2a and transverse bar 13 and a frame 3 forming a surface for lying,  
which in the embodiment is covered with an elastic knitting 4. The frame  
3 consists of two longitudinal bars 5 constructed in a foldable manner,  
which are held at a distance by transverse bars 6. The  
25 longitudinal bars 5 constructed in a foldable manner makes it possible  
in a known manner to divide the surface of the bed for lying into  
several sections, which can be inclined to one another under certain  
angles, as presented in Figures 1 and 2. However, the longitudinal bars  
5 can also be placed in a stretched position so that the bed exhibits a  
level surface for lying, as shown by the broken lines in Fig. 2. The  
adjustment of the longitudinal bars in the embodiment likewise follows  
in a known manner through an electric drive 7, shown with broken lines  
25 in Fig. 2. In Fig. 2, the surface of the bed for lying is provided with

an elastic cushion support 8, whose extended position is shown with 8' in Fig. 2.

5 The knitting 4 held tightly in the frame 3 consists of elastic synthetic threads, for which purpose a knitting made of polyester threads with approximately 25% elastomer polyester content is used. This known knitting, sold under the brand name "Gemstone Crystal Flex II" by Milliken Europe N.V. in Gent, Belgium, is an elastic weaving that can be stretched bidirectionally and that, according to the invention, is 10 inserted in prestressed condition into the bearing frame 3 at least crossways between the two longitudinal bars 5. The process involved will be discussed in detail using Figures 5 and 6.

15 Figures 3 and 4 show for the present, however, that the longitudinal bars 5, aside from being provided with the two transverse bars 6 placed at their ends, are also provided with additional transverse braces, each in the area of their two joint axles 9 and 10. Thus, in the area of the joint axle 9 that, like the joint axle 10 is 20 not made of a continuous wave or the like, but is made with joint arrangements only in the area of the longitudinal bars, a coupling is provided on the base frame 2, while an additional transverse reinforcing clip 12 is provided in the area of the articulated axle 10. This forms a stable, supporting frame 3, which can hold under a predetermined tensile stress, the elastic knitting 4 25 inserted.

This elastic knitting is put into the frame 3 in such a way that it is inserted in crosswise direction between the two longitudinal bars 5 with zones 14, 15, 16, 17 and 18 of varying prestress.

This is attained by providing the elastic knitting 4, as schematically presented in Fig. 5, before insertion into the frame 3, which is rectangular, with a cut contour deviating from the rectangular form, whose outer edges 4a run curved and, as shown in Fig. 5, is made wider in zones 15 and zone 17 than in the zones 14, 16 and 18. If, according to the invention, the outer contours 4a of this elastic knitting 4, are pulled outwards following the arrow 21 up to the longitudinal bars 5, a prestress greater than in the zones in between is created because of the greater extension between the longitudinal bars 5 in the zones 14, 16, and 18, making it possible to give the lying surface of the bed varying return forces distributed over the length of the longitudinal bars, which as desired, offers a varying soft supporting surface for a person using the bed.

However, Fig. 5 also makes it clear that even in Zones 15 or 17, the knitting 4 is still subjected to a prestress because it must be stretched outwards here, at least by the  $s$  amount, up to the particular longitudinal bars before it is mounted to the longitudinal bars. In zones 15 and 17, therefore, there would be return forces in the embodiment shown, depending on the stretching of the knitting 4 by the amount  $s$ , but in zones 16, 14 and 18, there would be return forces caused by the expansion of the knitting by the amount  $s$  plus  $s_x$ .

Figure 6 shows that the cut of the knitting 4 (Fig. 5), which is initially not rectangular, after it is made rectangular through the corresponding expansion, is fit and held into clamping strips 19 with the outer edges 4a, said clamping strips in turn set in receptacle strips 20, which are fastened to the longitudinal bars. The knitting 4

variedly stretched in this manner in different zones is then held at the frame 3 and can, as explained, form a surface for lying, which presents varying softness for a load.

5 Figs. 1 and 4 also makes it clear that in addition to the tension of the knitting, supports can also be provided beneath the same, and may consist of rails 24 with supports 22 arranged on them, and movable lengthways of the longitudinal bars 5, and which additionally support in certain locations the rest for the cushion and for a person. It would 10 also be possible to place supports on the knitting 4, which are intended, for instance, as lordosis support in the lumbar region or as knee joint supports in the support region of the legs of a person using the bed. These additional supports may, for instance, be fastened to a suitable location with a Velcro on the knitting 4.

15 Fig. 7 shows a modified embodiment of holding the textile structure tight to the side longitudinal bars 5. A clamping strip 19', comprising the three strip sections 19a, 19b and 19c, is provided for holding the edge of the textile structure tight. Between each of these strips, the margin of a textile structure 4a and the margin of a textile structure 4b is held tightly, in which the textile structure 4a and 4b, made of elastic threads, run parallel 20 to one another at a distance a, which may amount to between 3 and 5 cm in practice. The lower textile structure 4b is generally a little more tightly stretched than the upper structure 4a, and as was previously 25 explained in detail in Fig. 5, there may also naturally be a different tension here over the length of the longitudinal bars 5. When there is pressure on the mattress 8, the upper textile structure 4a sags, and if this sagging is greater than the distance a, the upper textile structure

4a rests on the lower 4b. Due to this measure, an essentially higher retention force and return force is provided from this point onwards. The embodiment according to Fig. 7 therefore allows an adjustment of the elasticity over a wide load range so that as a result, persons with low body weight, as well as those with greater body weight, can lie comfortably on the bed frame designed in such a manner.

Fig. 8 shows a variation of the embodiment with two textile structures 4a' and 4b' arranged one below the other. In the embodiment of Fig. 8, these two structures are part of a tube 4', which is pushed through lateral rods 27, which on their part are, in a manner not further illustrated, mounted rigidly, or as defined by the arrow 26, mounted so that they can be rotated on rails 25, which are solidly connected to the longitudinal bars 5 or with the receptacle strips 20 of the same. In this embodiment, through the load of the upper strand of the tube 4' formed by the structure 4a', the lower strand, i.e., the textile structure 4b', is additionally stretched so that even in this case, additional forces can be absorbed if the upper and lower strand of the tube 4' come into contact with each other.

It has previously only been explained that and in what type and manner the elastic knitting 4 is prestressed crosswise between the longitudinal bars 5. Of course, it is also possible to provide a varying tension in the direction of the longitudinal bars between the transverse bars 6, if desired.

However, problems in the joint axles 9, 10 may arise, where, as Fig. 1 shows, cover strips 23 running crosswise are placed on the

knitting 4, said cover strips protecting the folding edge of the knitting 4.

Patent Claims

5

1. Lounge chair with a frame (3) and with spring elements held by the frame, said spring elements forming the supporting surface, covering the frame, for mattresses, cushion covering or the like, characterized in that the spring elements consist of a textile structure (4) made of elastic threads in the form of a knitting or woven fabric out of synthetic threads, said knitting or woven fabric being held tightly under prestress, at least to the longitudinal bars (5) of the frame (3).

10

15 2. Lounge chair according to Claim 1, characterized in that the prestress of the textile structure (4) at right angles to the longitudinal bars (5) is, in at least one of several sections (14 to 18) running lengthways to the longitudinal bars (5), different from that in other sections.

15

20 3. Lounge chair according to Claim 1, characterized in that the outer contours (4a) of the textile structure (4) is held under prestress at the longitudinal bars (5) and at the transverse bars (6).

20

25 4. Lounge chair according to Claim 1, characterized in that supports (22) are provided beneath the textile structure.

25

5. Lounge chair according to Claim 4, characterized in that the supports (22) are fixed on to rails (24), which are movable in the direction of the longitudinal bars.

6. Lounge chair according to any one of Claims 1 to 5, characterized in that cushions in the shape of lordosis supports or knee joint supports can be placed on the textile structure.

5

7. Lounge chair according to any one of the previous claims, characterized in that the longitudinal bars (5) are designed to be foldable and form joint axles (9, 10) for the surface for lying.

10

8. Lounge chair according to Claim 1, characterized in that the knitting or woven fabric is made of polyester threads with an approximately 25% elastomer polyester content.

15

9. Lounge chair according to Claim 1, characterized in that the textile structure is made up of two textile structures lying at a distance one below the other.

20

10. Lounge chair according to claim 9, characterized in that each of the textile structures is held tightly with its edges at the longitudinal and transverse bars.

25

11. Lounge chair according to Claim 9, characterized in that the distance of the two textile structures is selected in such a way that at least a part of the surfaces of the textile structures rests on each other when there is a load.

12. Lounge chair according to Claim 9, characterized in that the textile structure is formed as a tube pulled over rods.

13. Lounge chair according to Claim 12, characterized in that the rods are mounted in such a way that they can be rotated, and are fastened to the longitudinal bars.

5           14. Method for the manufacture of a lounge chair according to Claim 1, characterized in that a cut to be inserted first into the frame (3), said cut being made of textile structure (4) formed by the threads, said textile structure having crosswise measurements less than the distance of the longitudinal bars (5) and whose outer contour (4a), at 10 least in one spot of one of the side walls, is not straight and parallel to the longitudinal bars (5) and that the cut formed in such a manner, while expanded at least in transverse direction, is fastened to the longitudinal bars (5) with its lengthwise-running outer contours (4a).

15           15. Method according to Claim 14, characterized in that the cut of the textile structure (4), also in the longitudinal direction, is less than the distance of the transverse bars (6) of the frame (3), and that the textile structure is fastened to the transverse bars also while expanded in longitudinal direction.

1. Lounge chair with a frame (3) and with spring elements held by the frame, said spring elements in the form of an elastic textile structure held under prestress between longitudinal bars, and forming a supporting surface, covering the frame, for mattresses, cushion coverings or the like, characterized in that the textile structure is made of knitting or woven fabric out of synthetic threads, and that the prestress of the textile structure (4), at least at right angles to the longitudinal bars (5) is, in at least one of several sections (14 to 18) running lengthways of the longitudinal bars, different from the one in the other sections.

2. Lounge chair according to Claim 1, characterized in that the outer contours (4a) of the textile structure (4) are held under prestress at the longitudinal bars (5) and at the transverse bars (6).

3. Lounge chair according to Claim 1, characterized in that supports (22) are provided beneath the textile structure.

4. Lounge chair according to Claim 3, characterized in that the supports (22) are attached to rails (24), which are movable in the direction of the longitudinal bars.

5. Lounge chair according to any one of Claims 1 to 4, characterized in that cushions in the form of lordosis supports or knee joint supports can be placed on the textile structure.

6. Lounge chair according to any one of the previous claims, characterized in that the longitudinal bars (5) are designed to be foldable and form articulated axles (9, 10) for the surface for lying.

5

7. Lounge chair according to Claim 1, characterized in that the knitting or woven fabric is made of polyester threads with a 25% elastomer polyester content.

10

8. Lounge chair according to Claim 1, characterized in that the textile structure is made up of two textile structures lying at a distance one below the other.

15

9. Lounge chair according to Claim 8, characterized in that each of the textile structures is tightly held with their edges to the longitudinal and transverse bars.

20

10. Lounge chair according to Claim 8, characterized in that the distance of the two textile structures has been selected in such a way that at least a part of the surfaces of the textile structure rests on each other when there is a load.

11. Lounge chair according to Claim 8, characterized in that the textile structure is designed as a tube pulled over rods.

25

12. Lounge chair according to Claim 11, characterized in that the rods are mounted in such that they can be rotated and are fastened to the longitudinal bars.

13. Method for the manufacture of a lounge chair according to  
Claim 1, characterized in that a cut to be inserted first into the frame  
(3), said cut being made of textile structure (4) formed by the threads,  
said textile structure having crosswise measurements less than the  
5 distance of the longitudinal bars (5) and whose outer contour (4a), at  
least in one spot of one of the side walls, is not straight and parallel  
to the longitudinal bars (5) and that the cut formed in such a manner,  
while expanded at least in transverse direction, is fastened to the  
longitudinal bars (5) with its lengthwise-running outer contours (4a).

10

14. Method according to Claim 13, characterized in that the cut of  
the textile structure (4), also in the longitudinal direction, is less  
than the distance of the transverse bars (6) of the frame (3), and that  
the textile structure is fastened to the transverse bars also while  
15 expanded in longitudinal direction.

15

20

25

30

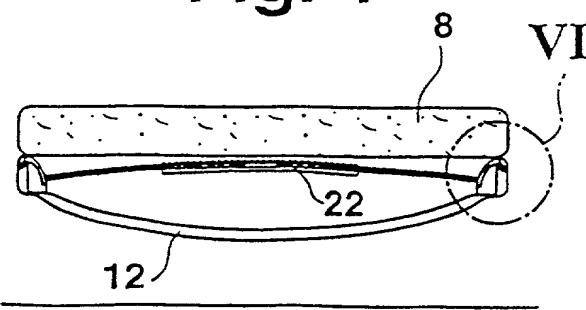
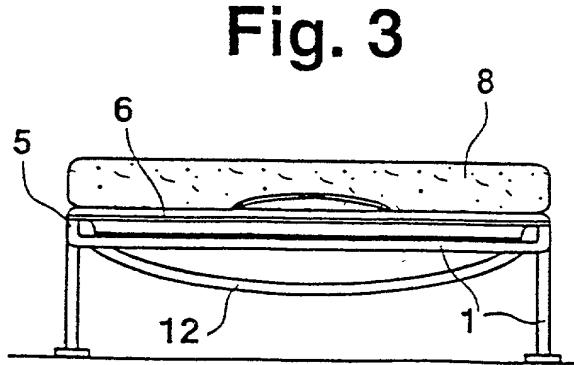
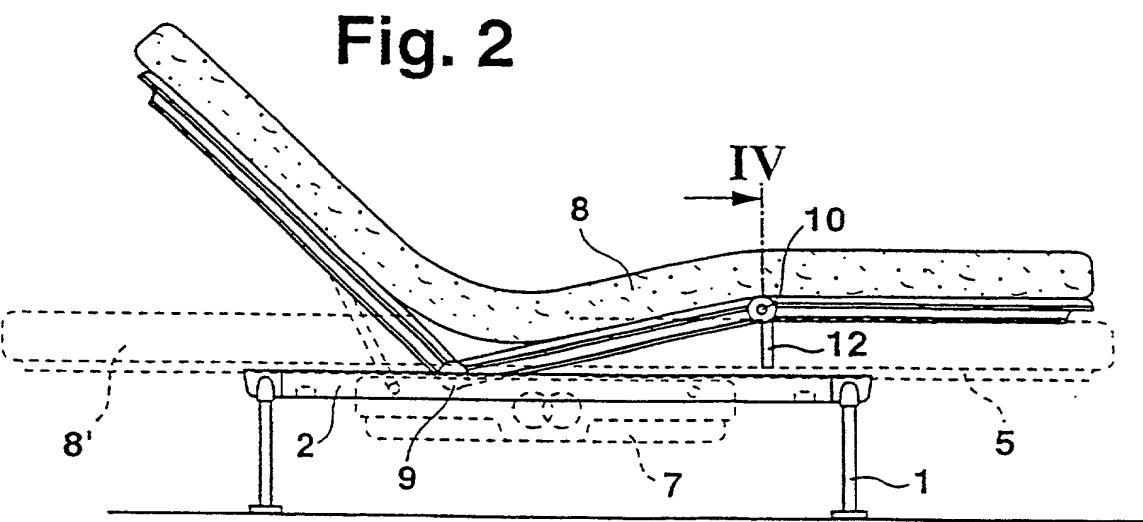
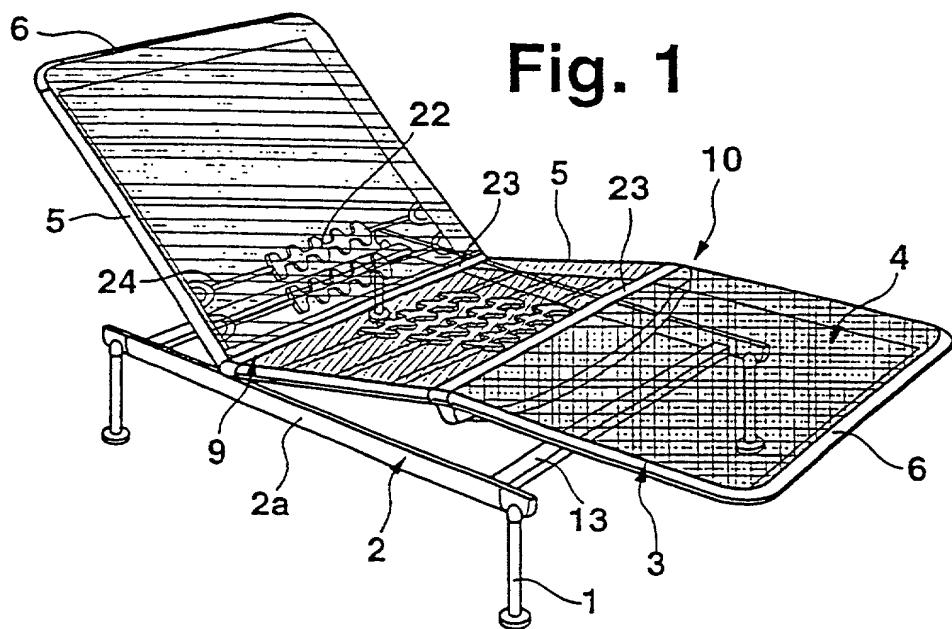


Fig. 5

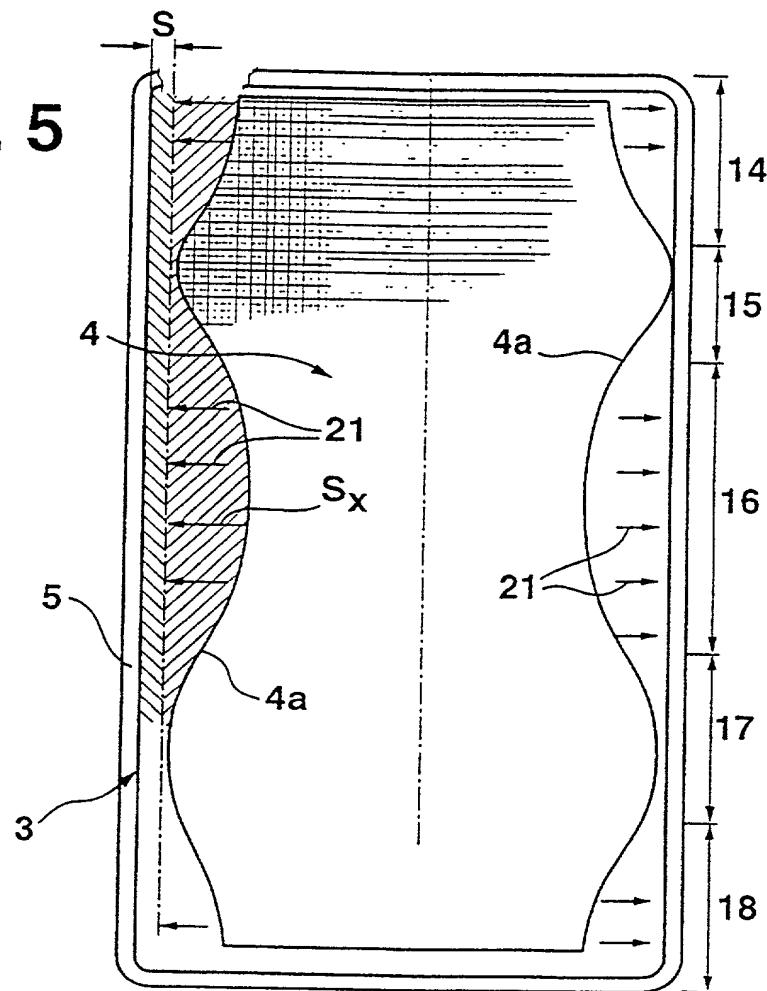
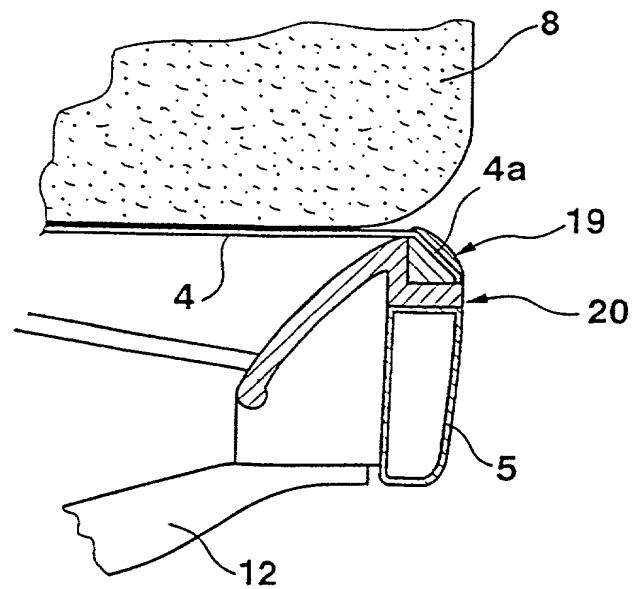
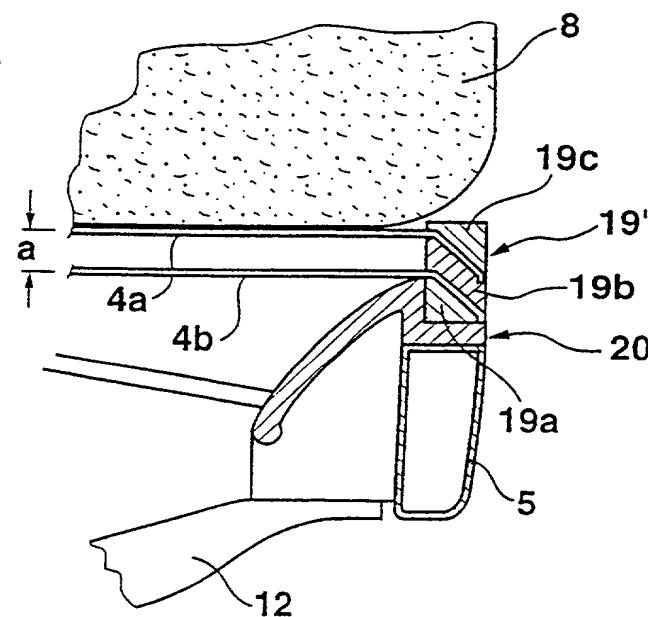


Fig. 6



**Fig. 7****Fig. 8**